

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings of claims in the application:

1-42. (Cancelled)

43. (Previously Presented): An isolated DNA sequence encoding a polypeptide having the enzymatic activity of amorpha-4,11-diene synthase, wherein the DNA sequence exhibits at least 70% homology to SEQ ID NO: 13 or the complementary strand thereof.

44. (Cancelled).

45. (Previously Presented): The DNA sequence as claimed in claim 43, which is at least 80% homologous to SEQ ID NO: 13.

46. (Previously Presented): The DNA sequence as claimed in claim 43, which has the sequence of SEQ ID NO: 13.

47. (Previously Presented): The DNA sequence as claimed in claim 43, wherein the sequence has been isolated from plants producing amorpha-4,11-diene.

48. (Previously Presented): A method for producing amorphadiene synthase, comprising transforming or transfecting a host cell with the DNA sequence claimed in claim 43.

49. (Previously Presented): A DNA construct comprising the DNA sequence as claimed in claim 43 operably linked to suitable transcription initiation and termination sequences.

50. (Previously Presented): A host cell comprising a DNA sequence as claimed in claim 43.

51. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a bacterial cell.

52. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a plant cell.

53. (Previously Presented): The host cell as claimed in claim 52, wherein the cell is derived from a plant itself producing sesquiterpenes.

54. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a cell selected from the group consisting of *A. annua*, *V. oblongifolia* and *E. coli*.

55. (Previously Presented): The host cell as claimed in claim 53, wherein the cell is derived from a plant selected from the group consisting of the genera *Carum*, *Cichorium*, *Daucus*, *Juniperus*, *Chamomilla*, *Lactuca*, *Pogostemon* and *Vetiveria*.

56. (Previously Presented): The host cell as claimed in claim 52, wherein the cell is derived from a plant, and wherein the biosynthesis of sesquiterpenoids can be elicited.

57. (Previously Presented): The host cell as claimed in claim 56, wherein the cell is derived from a plant selected from the group consisting of the genera *Capsicum*, *Gossypium*, *Lycopersicon*, *Nicotiana*, *Phleum*, *Solanum* and *Ulmus*.

58. (Previously Presented): The host cell as claimed in claim 52, wherein the cell is derived from a plant selected from the group consisting of soybean, sunflower and rapeseed.

59. (Previously Presented): The host cell as claimed in claim 50, wherein the cell is a yeast cell.

60. (Previously Presented): The host cell as claimed in claim 59, wherein the yeast cell is a cell selected from the group consisting of *Saccharomyces cerevisiae* and *Pichia pastoris*.

61. (Previously Presented): The host cell as claimed in claim 59, wherein the cell is an oleaginous yeast cell.

62. (Previously Presented): The host cell as claimed in claim 61, wherein the oleaginous yeast cell is a *Yarrowia lipolytica* cell.

63. (Previously Presented): The host cell as claimed in claim 50, which cell is part of a tissue or organism.

64. (Currently Amended): A transgenic plant tissue, ~~consisting comprising~~ at least ~~part of~~ the host cells as claimed in claim 50.

65. (Currently Amended): A transgenic plant organism, ~~consisting comprising~~ at least ~~part of~~ the host cells as claimed in claim 50.

66-68. (Cancelled).

69. (Withdrawn): A method of preparing amorphadiene, comprising the steps of:

- a) transfecting or transforming a suitable host cell with a DNA sequence as claimed in claim 43 to obtain transgenic host cells;
  - b) expressing the said DNA sequence in the presence of farnesyl pyrophosphate (FPP) to form amorphadiene; and
  - c) isolating the amorphadiene thus formed,
- wherein the expression level of the amorphadiene synthase is higher in transgenic host cells, tissues or organisms harboring an endogenous version of the DNA sequence than in non-transgenic host cells, tissues or organisms.

70. (Cancelled).

71. (Withdrawn): A method of preparing artemisinin, comprising:

- a) transfecting or transforming a suitable host cell, tissue or organism with a DNA sequence as claimed in claim 43 to obtain transgenic host cells, tissues or organisms;
  - b) expressing the said DNA sequence in the presence of farnesyl pyrophosphate (FPP); and
  - c) isolating the amorpha-4,11-diene thus formed,
- wherein the transgenic host cells, tissues or organisms harbor the genetic information coding for the enzymes that further convert amorpha-4,11-diene to artemisinin and wherein the expression level of the amorpha-4,11-diene synthase is higher in transgenic host cells, tissues or organisms harboring an endogenous version of the DNA sequence than in non-transgenic host cells, tissues or organisms.

72. (Withdrawn): A source of artemisinin, comprising host cells, tissues or organisms harboring a DNA sequence as claimed in claim 43 and the genetic information coding for the enzymes that further convert amorpha-4,11-diene to artemisinin, which host cells, tissues or organisms have expressed the said DNA sequence.

73. (Withdrawn): The source as claimed in claim 72, wherein the cells are cells selected from the group consisting of bacterial cells, yeast cells or plant cells.

74. (Withdrawn): The source as claimed in claim 72, wherein the cells are disrupted.

75. (Currently Amended): A non-human transgenic cell, tissue or organism harboring in its genome more copies of a DNA sequence as claimed in claim 43 than are present in a corresponding non-transgenic cell, tissue or organism.

76. (Previously Presented): The transgenic cell as claimed in claim 75, which cell is an *E. coli* cell.

77. (Previously Presented): The transgenic cell as claimed in claim 75, which cell is a *Saccharomyces cerevisiae* cell.

78. (Previously Presented): The transgenic cell as claimed in claim 75, which cell is a *Yarrowia lipolytica* cell.

79. (Previously Presented): The transgenic organism as claimed in claim 75, wherein the organism is a plant itself producing sesquiterpenes.

80. (Previously Presented): The transgenic organism as claimed in claim 79, wherein the organism is an organism selected from the group consisting of *A. annua* and *V. oblongifolia*.

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81. (Previously Presented): The transgenic organism as claimed in claim 79, wherein the organism is a plant selected from the group consisting of the genera *Carum*, *Cichorium*, *Daucus*, *Juniperus*, *Chamomilla*, *Lactuca*, *Pogostemon* and *Vetiveria*.

82. (Previously Presented): The transgenic organism as claimed in claim 75, wherein the organism is a plant in which the biosynthesis of sesquiterpenoids can be induced by elicitation.

83. (Previously Presented): The transgenic organism as claimed in claim 82, wherein the organism is a plant selected from the group consisting of the genera *Capsicum*, *Gossypium*, *Lycopersicon*, *Nicotiana*, *Phleum*, *Solanum* and *Ulmus*.

84. (Previously Presented): The transgenic organism as claimed in claim 75, wherein the organism is a plant selected from the group consisting of soybean, sunflower and rapeseed.

85. (Previously Presented): The DNA sequence as claimed in claim 44, which is at least 90% homologous to SEQ ID NO: 13.

86. (Previously Presented): The DNA sequence as claimed in claim 44, which is at least 95% homologous to SEQ ID NO: 13.